concerning this prediction until the winds actually had recorded a new velocity record for the city.

The New Orleans Item, October 13, 1915, says:

About 20 years ago a West Indian hurricane, far lighter in force and stress than the recent storm, struck the Gulf coast. Over 2,000 lives were lost and many millions in property.

Ten days ago another West Indian hurricane came with tremendously increased intensity. But the loss in life in all the vast stretch of marsh and bayou and sea line is only 275. The property damage is infinitely less.

There is one specific reason for this difference in results: Increased efficiency in the Weather Bureau and an increased and extended service rendered possible by enlarged personnel and extended range of observations.

The News and Courier (Charleston, S. C., Oct. 1, 1915) published the following comment on the Weather Bureau's services:

WEATHER BUREAU MAKES GOOD AGAIN.

For the third time this season [fall of 1915] the United States Weather Bureau has been put to the test and for the third time it has proved its worth. Three great tropical storms have swept upon the shores of this country out of the southern waters where these tempests are brewed. But for the Weather Bureau's good work it is certain that each of these storms would have blotted out thousands of lives along the coasts of the Gulf States.

The News and Courier has already made acknowledgment of its realization of how fine the bureau's work has been. Now that for the third time this year the bureau has been put to the test and has met it admirably, a further acknowledgment is due. Seldom, if ever before, has the bureau been confronted with more important problems than those which it has met and solved this year, and this latest demonstration of its efficiency should not be allowed to pass without remark.

CONDENSATION UPON AND EVAPORATION FROM A SNOW SURFACE.[1]

By B. ROLF.

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The following experiments were carried out in Swedish Lapland. Four shallow zinc trays, each about 600 square centimeters in area and 3 centimeters in depth, containing snow, were exposed in the open upon the snow-covered ground in such a way that their rims were level with the general surface of the snow. The trays were carefully filled with snow before each experiment and weighed. They were again weighed after an exposure of 24 hours in winter, or 12, 6, 3, or even 2 hours in summer. The difference in weight gives the gain or loss by condensation or evaporation. The experiments were carried out uninterruptedly from December, 1905, to July, 1906, but most of the results could not be used, being vitiated by disturbing causes. Of these, drifting snow was the principal in winter, and absorption of solar radiation by the trays was common in summer, producing an excess of melting and evaporation. The results of the experiments which were finally accepted as trustworthy are printed in full. In winter, and up to the beginning of June, the ground was completely covered with snow, but afterwards numerous bare patches were rapidly developed, and by the middle of July the snow had disappeared. Before June, water vapor therefore passed between the air and a snow surface; afterwards humid soil enters also into the process.

It is found that when snow covers the ground the condensation, C, can be connected with the duration of exposure in hours, t, the maximum vapor pressure at the temperature of the snow layer, f, and the actual vapor-pressure of the surrounding air, F, by the formula

$$C = at + b(F-f)t,$$

[1] See Ark. f. Mat., astron., och fysik, Stockholm, 1914, 9; 35. p. 1–19.

where a and b are constants which are determined from the observations by the method of least squares. A negative value of C indicates an evaporation instead of a condensation. In winter a is practically zero, and the formula is

$$C = +0.0174(F-f)t.$$

In spring, when the air temperature is above 0° C., and the snow still covers the ground, f is the saturation of vapor-pressure at 0°C., and is therefore constant (4.6 mm. of mercury). The formula becomes

$$C = -0.0010t + 0.0168(F-4.6)t.$$

The cases when the ground is only partially covered could not be expressed by a similar formula, but it was found that by grouping the experiments according to time of day, values of a and b could be computed for each group and these values showed a marked diurnal variation. Thus in the morning a was $+0.009$; it reached a maximum of $+0.020$ in the afternoon, and fell off again in the evening and night. The constant b also showed a maximum during the day hours of about $+0.029$ and a minimum during the night of $+0.016$. The errors resulting from the use of these formulas are small in comparison with the amount of condensation or evaporation.—*R. Corless.*

RELATION BETWEEN MONTHLY VALUES OF ATMOSPHERIC PRESSURE VARIATION AND SIMULTANEOUS MONTHLY VALUES OF TEMPERATURE VARIATION AND HUMIDITY, AND GEOGRAPHICAL LATITUDE.[1]

By N. EKHOLM.

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Köppen has considered the relation between pressure variation and the latitude of the observing station, the "deflecting force of the earth's rotation," and the friction between air and earth; but as the energy of all atmospheric motions can ultimately be expressed in terms of temperature and humidity, the author endeavors to discover a relation between pressure variation on the one hand and temperature variation, humidity, and latitude of observing station on the other. Hann had already found that temperature variations alone can not account for the observed pressure variations.

The investigation refers to the three winter months, December to February only, and the data used are monthly values from 23 stations between latitudes 50° N. and 70° N. If L is mean monthly pressure variation, W the simultaneous temperature variation, and F the simultaneous mean vapor pressure for a station of which the latitude is ϕ, it is found that the equation

$$L = 8.73 \sin^2 \phi \, F + 1.07 \sin^3 \phi \, W$$

expresses with considerable accuracy the dependence of L upon ϕ and W. The equation applies both to continental stations where F is small and W is large, and to maritime stations where F is large and W is small. Thus the values of the two terms on the right-hand side of the equation for the two stations Iakutsk (Siberia) and Valencia (southwestern Ireland) are respectively 0.88, 28.01, and 34.86, 8.69. The computed values of L are therefore 28.9 and 43.5, which differ from the actual values by 1.4 and 2.1.—*R. Corless.*

[1] See Ark. f. Mat., astron. och fysik, Stockholm, 1914, 10; 3. p. 1–111.